

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. - 3. (Canceled)

4. (Original) ~~The A disk drive according to claim 1,~~ for perpendicular magnetic recording, comprising:

a head which reads out a data signal recorded in a disk medium; and

a read channel which includes a signal processing unit having lower cut-off frequency characteristics and including a high-pass filter which carries out removal of low-frequency noise of the data signal outputted from the head and a decoding unit which decodes recording data from the data signal,

wherein the read channel includes:

an extracting unit which extracts a component of a shift in a base line of the data signal processed by the signal processing unit, and

a compensating unit which removes the component of the shift in the base line from the data signal, and

wherein the extracting unit has:

a generator which generates an ideal data signal;

a subtracting unit which outputs a difference data signal according to difference between the ideal data signal and a data signal processed by the signal processing unit; and

an adjusting unit including a gain adjusting circuit and a high-frequency cut-off filter, which process the difference data signal, the adjusting unit generating a signal corresponding to the component of the shift in the base line.

5. (Original) ~~The A disk drive according to claim 1,~~ for perpendicular magnetic recording, comprising:

a head which reads out a data signal recorded in a disk medium; and

a read channel which includes a signal processing unit having lower cut-off frequency characteristics and including a high-pass filter which carries out removal of low-

frequency noise of the data signal outputted from the head and a decoding unit which decodes recording data from the data signal,

wherein the read channel includes:

an extracting unit which extracts a component of a shift in a base line of the data signal processed by the signal processing unit, and

a compensating unit which removes the component of the shift in the base line from the data signal, and

wherein the extracting unit has:

a generator which generates an ideal data signal;

a subtracting unit which outputs a difference data signal according to difference between the ideal data signal and a data signal processed by the signal processing unit; and

an adjusting unit including a gain adjusting circuit and an integrating circuit, which have high-frequency cut-off characteristics processing the difference data signal, the adjusting unit generating a signal corresponding to the component of the shift in the base line.

6. (Canceled).

7. (Original) The disk drive according to claim 4, further comprising a parameter adjusting unit which adjusts a cut-off frequency parameter of the high-frequency cut-off filter included in the extracting unit and a gain parameter set into the gain adjusting circuit.

8. (Original) The disk drive according to claim 5, further comprising a parameter adjusting unit which adjusts a gain parameter set into the gain adjusting circuit included in the extracting unit.

9. (Canceled).

10. (Currently Amended) The A disk drive according to claim 9, using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;

and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the decoding unit includes a Viterbi detector which carries out ML type of data detection processing from the sample data, and which further comprises a generator which generates the ideal sample data from a data series detected by the Viterbi detector.

11. – 12. (Canceled).

13. (Currently Amended) ~~The A disk drive according to claim 9,~~ using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;

and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the extracting unit includes an integrating circuit and a gain adjusting circuit which have high-frequency cut-off characteristics processing the difference data signal, and which further comprises a parameter adjusting unit which adjusts a gain parameter set in the gain adjusting circuit according to a zone of a read object decided in the read operation.

14. (Currently Amended) The A disk drive according to claim 9, using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;  
and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the extracting unit includes a high-frequency cut-off filter which processes the difference data signal, and which further comprises a parameter adjusting unit which adjusts a cut-off parameter of the high-frequency cut-off filter according to a temperature value detected in the read operation.

15. (Currently Amended) The A disk drive according to claim 9, using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;  
and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the extracting unit includes a high-frequency cut-off filter and a gain adjusting circuit which process the difference data signal, and which further comprises a parameter adjusting unit which adjusts a cut-off frequency parameter of the high-frequency cut-off filter and a gain parameter set in the gain adjusting circuit according to a temperature value detected in the read operation.

16. (Currently Amended) The A disk drive according to claim 9, using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;  
and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the extracting unit includes an integrating circuit and a gain adjusting circuit which have the high-frequency cut-off characteristics processing the difference data signal, and which further comprises a parameter adjusting unit which adjusts a gain parameter set in the gain adjusting circuit according to a temperature value detected in the read operation.

17. (Canceled).

18. (Currently Amended) The A disk drive according to claim 9, using a disk medium in which a plurality of groups of data tracks for recording a data signal is formed by a perpendicular magnetic recording method and each group of data tracks is managed in each plurality of zones, comprising:

a head to read out a data signal recorded in a disk medium in read operation;

and

a read channel to process the data signal outputted from the head by a PRML signal processing method to reproduce recording data,

wherein the read channel includes:

a high-pass filter circuit having lower cut-off frequency characteristics;

a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

a decoding unit to decode the recording data from the sample data;

an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data; and

a compensating unit which removes the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit, and

wherein the extracting unit includes a high-frequency cut-off filter and a gain adjusting circuit which process the difference data signal, and which further comprises a retry control unit which carries out retry of the read operation in the case that data decoded by the decoding unit is error data in the read operation; and a parameter adjusting unit which adjusts a cut-off frequency parameter of the high-frequency cut-off filter and a gain parameter set in the gain adjusting circuit in the retry operation.

19. (Currently Amended) ~~The A disk drive according to claim 1, for~~  
perpendicular magnetic recording, comprising:

a head which reads out a data signal recorded in a disk medium; and

a read channel which includes a signal processing unit having lower cut-off frequency characteristics and including a high-pass filter which carries out removal of low-frequency noise of the data signal outputted from the head and a decoding unit which decodes recording data from the data signal,

wherein the read channel includes:

an extracting unit which extracts a component of a shift in a base line of the data signal processed by the signal processing unit, and

a compensating unit which removes the component of the shift in the base line from the data signal, and

wherein the extracting unit includes a integrating circuit and a gain adjusting circuit which have the high-frequency cut-off characteristics processing the difference data signal, and which further comprises a retry control unit which carries out retry of the read operation in the case that data decoded by the decoding unit is error data in the read operation; and a parameter adjusting unit which adjusts a cut-off frequency parameter of the high-frequency cut-off filter and a gain parameter set in the gain adjusting circuit in the retry operation.

20. (Original) A read channel which is applied to a disk drive using a head to read out a data signal recorded in a disk medium by a perpendicular magnetic recording method

and processes the data signal outputted from the head by a PRML signal processing method to reproduce recording data, comprising:

- a high-pass filter having lower cut-off frequency characteristics;

- a signal processing unit which generates sample data obtained from the data signal outputted from the high-pass filter circuit by a PR type of waveform equalizing processing;

- a decoding unit to decode the recording data from the sample data;

- an extracting unit which extracts a component of a shift in a base line included in the data signal according to difference data between the sample data and an ideal sample data, the extracting unit including an integrating circuit or a gain adjusting circuit which has a high-frequency cut-off filter or high-frequency cut-off characteristics and generating a signal corresponding to the component of the shift in the base line;

- a compensating unit to remove the component of the shift in the base line from the data signal to transmit the data signal to the signal processing unit; and

- a register to adjust a cut-off frequency parameter of the high-frequency cut-off filter and a gain parameter set in the gain adjusting circuit.

21. (Canceled).